

# The Cary Arboretum



of The New York Botanical Garden

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## Arboretum Names Contractor for Solar-Heated Building; Construction to Start Shortly

John Lowry, Inc., of New York City has been named as general contractor to construct the Cary Arboretum solar-heated Administration and Research Building. Construction will begin in April and is scheduled for completion in the summer of 1977.

The Administration and Research Building, the second major new structure to be built on the Arboretum grounds, epitomizes the Arboretum's commitment to Environmental principles. In addition to deriving its heat from the sun and from a supplemental heat pump, the building will contain a variety of recycling systems, special insulation, and other design and mechanical features to conserve energy resources and minimize disturbance of the surrounding environment. A greenhouse-nursery complex was constructed in 1973.

The environmental design of the Administration and Research Building, and its solar-based heating system, will reduce its requirements for outside energy by at least 35%, compared to a conventional structure. The solar system will provide an estimated 85% of the building's heating requirements, and the heat pump will provide the balance. The building will not contain any conventional furnace or electric resistance heating.

The cost of the building, including the contract award to John Lowry, Inc., as well as furnishings, site work, and other expenses will total more than \$3,000,000. While the cost is somewhat higher than for a conventional building, the Arboretum expects that, over a

period of years, savings on fuel and electrical energy will amortize the added cost of installing the special environmental systems, particularly solar heating.

The Arboretum has applied to the Federal Energy Research and Development Administration and to the New York State Energy Research and Development Authority for grants on a cost-sharing basis to help defray the expense of the solar equipment and special instrumentation in the building to monitor the solar systems. Information collected with the aid of any such grants would be made publicly available to assist other organizations interested in constructing solar-heated buildings.

It is expected that the bulk of the construction funds will be spent for labor and materials in the Dutchess County area during the next 15 to 18 months.

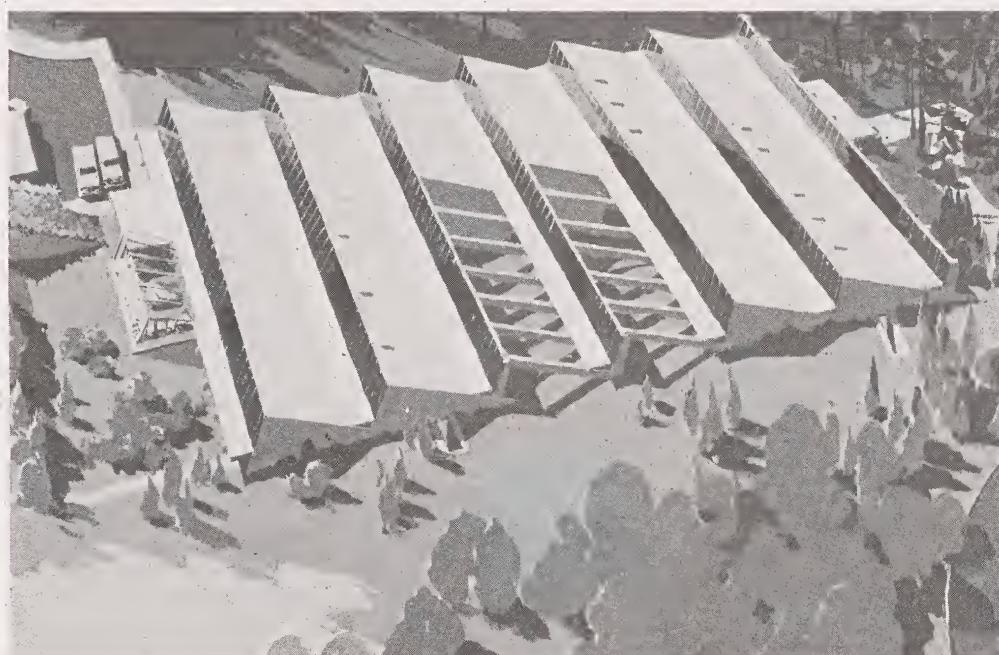
The two-story building was designed by Malcolm B. Wells, a Cherry Hill, New Jersey,

architect, who specializes in architecture that, he says, is "gentle to the environment." Fred Dubin of Dubin-Mindell-Bloome Associates, West Hartford, Connecticut, and New York City, an expert on solar energy, is the consultant and design engineer for the heating, plumbing and electrical systems in the building.

The new building, which will become the headquarters for the Arboretum, will be located on the Sharon Turnpike, on the eastern side of the Arboretum's property. Since the groundbreaking ceremonies were held last April, the excavation for the lower floor has been completed and driveways and other preliminary site work have been prepared.

The setting for the building is a large flat field framed by a small range of hills and set on the edge of a ravine heavily wooded with virgin hemlock. The construction contract requires that great care be taken to leave the meadows and woodland around the building

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*The Cary Arboretum Administration and Research Building in Millbrook is portrayed in this rendering by architect Malcolm Wells. Seven rows of solar collectors facing south are mounted on the roof. Construction will begin shortly.*

undisturbed and to minimize litter and pollution.

For maximum insulation, about two-thirds of the height of the building will be below ground, and earth will be banked against the north and west walls. Insulating material will be applied to the outside of the foot-thick masonry walls for added insulation and so that the building mass can act as a thermal reservoir. The building is U-shaped with a semi-enclosed central courtyard. View-slots and south-facing windows will also help to "bring the outdoors indoors."

The plans call for 28 rooftop skylights which will admit natural light and the sun's warmth in the daytime but which can be covered at night to retain heat. As another heat-saving measure, all windows will be double-glazed and will be protected at night with insulated shutters. For further energy conservation, windows on the south and east will be extra large to admit the rays of the winter sun, while those on the colder sides of the building will be narrower. Windows will be operable for natural cooling in summer.

Rainwater from the building will be collected in a cistern and used to provide for garden irrigation, for flushing toilets, and stored for fire protection.

Interior lighting will be supplied by "task lights" that shine directly on desks and other work areas, supplemented with low-wattage background illumination. This will be considerably more economical than the customary uniform lighting in office buildings.

The solar energy system will absorb the sun's rays by means of seven rows of solar collectors in a saw-tooth arrangement on the roof. The 5,340 net square feet of glazed black panels, whose absorbing surfaces contain passages filled with water and an anti-freeze solution, will be tilted 60° and face true south. The fluid, warmed by the sun, will convey its heat through a heat exchanger to two insulated tanks in the basement for release through the building's heat and hot water systems. One tank will hold 10,000 gallons of water and the other 5,000 gallons. Each tank will be of reinforced concrete, using building foundation walls as portions of the tanks.

The heat pump, a standard device that extracts heat by taking advantage of temperature differences, is intended to be used as a supplement to the solar collectors, especially during extended periods of cloudy weather in December and January. The heat pump will be electrically operated and can use either well water or low temperature solar water as its heat source.

The building will also contain a standby diesel-driven generator in case of failure in outside power service. The jacket and exhaust heat from the generator will be captured, if needed, as still another backup heat source.

Other environmental features in the building include fully weather-stripped windows, tight sealing of all outside structural joints

to prevent heat loss, and use of outgoing air expelled from the building to heat or cool incoming air, thus performing a double function.

Well water will be used in two different ways — both for normal uses, and as an underground "cooling tower" for the temperature control system. Air in the ventilation system will be circulated in varying volume, depending on the needs of different rooms. In hot weather all the air in the building will be flushed out at the end of the day and replaced with cool night air, thus saving work for the air conditioning machinery.

The Cary building will contain nine research laboratories for staff scientists doing work in the fields of dendrology, taxonomy, genetics, morphology, ecology and plant pathology, as well as work space for horticulturists and other specialists. It will also house an experimental greenhouse and a herbarium, library and administrative offices. Conference rooms in the building will be used for scientific meetings and other events.

To assure protection of the surroundings, the construction contract stipulates dollar values for all existing natural features, such as wildflowers and trees, and requires the contractor to pay replacement value in case of damage by a construction-related activity such as erosion, siltation, vibration, smoke, compaction, toxic wastes or litter.

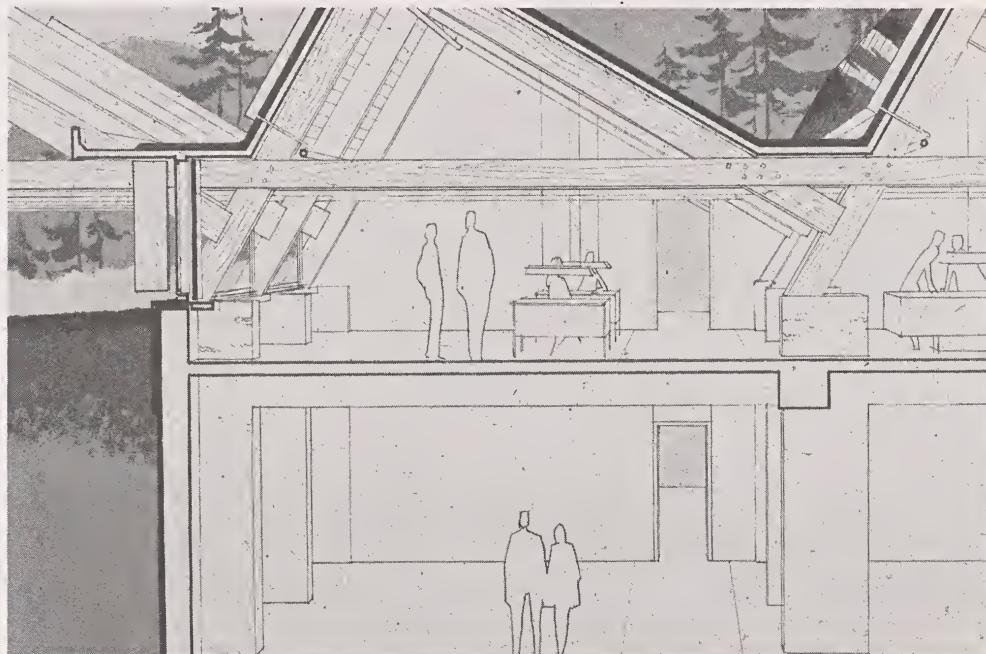
The office areas inside the building will feature an open "landscape" plan to save partitioning, light and heat. Wooden beams will be left exposed. Wherever feasible, living plants will be used as space dividers. The interior design is being handled by Interspace, Inc., of Philadelphia. Enis Y. Baskam of Hicksville, New York, is the structural consultant; site planning is by Environmental Planning and Design, Pittsburgh, Pennsylvania.

The Lowry firm, founded in 1907, built many of the buildings in Rockefeller Center. Currently they are doing construction for

Stevens Institute and the Federal Reserve Bank of New York. Daniel F. Brown is project manager for the Arboretum. James Scott of the Arboretum staff is "clerk of the works."

Funding for the building is being furnished by the Mary Flagler Cary Trust which established the Arboretum and supports its operations.

*A cross-section of the solar-heated Administration and Research Building of the Cary Arboretum in Millbrook. The building is sheltered by a range of hills in the background.*



# Dan Brown Manager of Capital Projects



As a dedicated city-dweller, Dan Brown admits that he had "a few qualms" when he arrived in Millbrook in May 1974 to start work as the Capital Projects Manager for the Cary Arboretum. Up until that time, he couldn't quite see himself as "a country boy," even though he was born and raised in the most rural part of New York City — Staten Island.

Though Dan's duties since his move here have allowed him comparatively little time to acclimate to real country life, he has managed to cultivate a vegetable garden, which he looks upon as an important adjunct to two of his other hobbies — cooking and then serving the gourmet results to his friends. Dan has learned how to handle a gun during the hunting season, an activity which we suspect he also regards as closely related to his culinary interests. Add to this the fact that he has been an avid and competent fisherman from "way back," and we have all

the ingredients necessary to make a countryman out of the Arboretum's able and sophisticated young official.

Dan, who is 34, attended the University of Virginia before receiving a B.A. from Wagner College on Staten Island. In 1963 he entered Columbia University School of Architecture, where, after two years, he continued his studies at night and earned his B. Arch. in 1971.

During these years Dan acquired some solid working experience in his chosen field. He was construction coordinator with the firm of Davis Brody Associates, which built several high-rise housing projects for the New York City Housing Authority.

He then joined the staff of the firm of Brown, Lawford, and Forbes and worked at the Metropolitan Museum of Art in New York, where he was manager of a 5.5 million dollar reconstruction project, which involved the complete interior rebuilding of the Museum's European galleries. A particularly interesting facet of this job, Dan recalls, was when some old springs, last seen in 1906, gushed forth in the gutted interior of the galleries' deep new basement on which he was working.

Immediately before joining the Cary staff, Dan supervised construction of new greenhouses and a complex heating plant at the New York Botanical Garden in the Bronx.

Dan's first assignment in Millbrook was to supervise construction of the new inner road system that meanders through the Arboretum's 2,000 acres. This was followed by supervision of the Greenhouse-Nursery area renovations, including the recently com-

pleted Cold Storage Building. He also has kept a professional eye on renovations of the early 19th century Crear House, and he is now scheduled to coordinate work on the handsome Gifford House, which is slated to become the Arboretum's Educational Center after completion of alterations.

Dan's major task, of course, has been, and will continue to be, coordination of all facets of construction relating to the exciting solar-heated Research and Administration Building on the Sharon Turnpike. For many months he has been coordinating the complex working plans of consultants, engineers, and the architect.

Despite a 12-hour workday, which Dan considers "par for the course," he has managed to pursue many of his outside interests. He has found time for skiing, both in Vermont and in the Alps. He is an avid bridge player and belongs to a local bridge club. And he still manages to pursue his interests in gardening, hunting, fishing, cooking, and tennis! He will not reveal his secret source of energy.

And, despite the heavy pressure of his work, he has also managed to stop smoking, much to the amazement of his co-workers at the Arboretum. So, protestations or not — country life seems to agree with the busy bachelor, Dan Brown.

## Arboretum Volunteer Program Off and Running

Twenty-two volunteers have begun their services to the Cary Arboretum under the recently inaugurated volunteer program, supervised by Peter Dykeman, Coordinator of Education. Several others soon will be assigned to positions.

Each of the volunteers participated in a four-session orientation program, after which they were assigned to a project in their special field of interest. Several are working on more than one project:

The largest number of workers are helping in the Education office, doing class preparations, cataloguing the slide collections, and inventorying education equipment and supplies.

Mrs. Ginny Sherman and Mrs. Ginette LaLiberte are interested in photography and are re-photographing a collection of old pictures of the Cary grounds, some of which were taken by Mrs. Mary Flagler Cary. The new photographs will be in slide form, as well as negatives, and will be placed in the

permanent slide collection.

In the Horticulture department, Mr. Phil LoPresti and Ms. Andra Sramek are helping with plant propagation and plant care. Mrs. Rose Michaelis and Mrs. Alice Simon have been volunteering at the Greenhouse for more than a year as part of the Retired Senior Volunteer program. Mrs. Julie Morgan is preparing herbarium specimens. This involves pressing, mounting and labeling plants. Mrs. Anne Strain and Mrs. Allelu Kurten are recording data and tracing origins of plant materials received early in the Arboretum history for plant records.

Six volunteers are working on a historical research project, which involves tracing of land use patterns, researching Cary land ownership from old deeds, and recording verbal history about the Arboretum area. The group includes Mrs. Vera Walters, Mrs. Dorothy Watson, Mrs. Helen Meurs, Mrs. Diana Bandler, Mrs. Helen Ross, and Mrs. Barbara Emerson. The entire volunteer group was saddened by the recent death of Mr.

William Coddington of Millbrook who was also to work on the history project.

A wildlife research program for volunteers is planned to get under way later in the year with Mrs. Elaine Smith and Mrs. Elizabeth Stratton as participants.

Volunteers will also be trained as guides for visiting groups, including such activities as greenhouse tours, grounds tours and nature tours for school and scout groups.

Greenhouse and general guides are Mrs. Vera Walters, Mrs. Ruth Greenwood, Mrs. Gloryann Webb, Mrs. Anne Strain and Mr. LoPresti.

Natural history guides include Mr. Kevin Gormley, Mrs. Katherine Pacenza, Mrs. Sue Mackson, Mrs. Marge Triebel, Mrs. Ross, Mrs. Sherman, Mrs. Greenwood, Mrs. Webb and Mr. LoPresti.

Another orientation program for volunteers is planned for later this year. Those interested in joining the volunteers may call the Education and Wildlife Center at 677-5348 for information.

# Cary Perspectives

After more than three years of discussion, planning, investigating, negotiating, and scheduling, the Arboretum's long-dreamed-of Research and Administration Building is about to take shape. As with all programs and developments at the Arboretum, our fundamental commitment to environmental responsibility has received the greatest emphasis throughout the planning stage and will be continuously stressed during construction.

In a purely functional sense a building is a special enclosed space whose environment is modified and controlled to permit, if not to promote, certain human activities. Since people function best in a relatively narrow range of temperature, humidity, lighting, ventilation, noise, etc., buildings are designed to keep these factors within acceptable limits and to isolate human occupants from distracting diversions in any of these factors. But a building is more than this. It is also an art form, the product of technique, not only to fulfill the practical and expressive requirements of civilized people, but also to communicate human experience and ideas through form. Thus, the architect or designer of a building not only respects the physical requirements of people, but also communicates basic cultural ideas and attitudes in his treatment of space and mass, composition, scale, light, texture, and color, and in his use of symbols.

Thus, much thought and reflection goes into many buildings, although sometimes only indirectly, as many buildings are copies of others. Very often, however, high conceptual ideas are seriously compromised by stringent financial limitations. Regrettably, many a building that is made palatable in capital expense turns out unpalatable in operation. But even the best of buildings have negative environmental impacts, immediate and eventual, on-site and afar, and one of our

signal goals in the design and planning of this building has been to keep these impacts to a minimum, both by keeping to high conceptual principles and by following a very careful plan of execution.

In keeping with these goals, we early decided to question numerous conventions that have become architectural and engineering habits and start from a much more fundamental plan. Item: It is well known that temperatures below ground are much more moderate than above; so why not immerse the building in this more temperate environment, away from the truly intemperate aerial environment, choosing a well-drained site, but at the same time making some provision for our human desire to enjoy distant vistas and employ natural light? Item: It is well known that cold wind comes from the north, warm wind from the south, and that the winter sun stays low in the southern sky, but in summer shines overhead. Why not forsake the slavish uniformity of window size and placement by designing fenestration individually to suit external realities and internal needs? Item: It is well known that liquid and gaseous fossil fuels are rapidly running out, that coal of acceptable quality is escalating in cost, that electricity, however generated, is unacceptable for space heating, both for pragmatic reasons of high cost and theoretical reasons of thermodynamic inappropriateness. Why not use existing technology to capture the rays of the sun and use its energy to provide heat both for domestic water and to warm and cool internal air spaces?

These and many other questions have led us down unexpected pathways, consumed much additional time, and dominated our thoughts for many months. No less important than having the services of a competent and sympathetic architect (Malcolm Wells), a first rate engineering firm (Dubin-Mindell-Bloome

Associates), and a dedicated site consultant (Environmental Planning and Design), has been finding a contractor experienced and sensitive to the special challenges in this building. We are pleased that the firm of John Lowry, Inc., has been selected as contractor and that work on the building is getting underway.

Behind the scenes at the Arboretum, the very complex job of coordinating the efforts of architect and engineer with consultants in lighting, furnishings, site work, instrumentation (to measure effectiveness of solar heating and cooling), and other aspects has lain in the competent hands of Daniel F. Brown, capital projects manager. Among the Arboretum's professional staff members most deeply involved have been Drs. Thomas Elias and Robert Goodland, assistant directors, both involved with scientific facilities; Messrs. Carlton Lees, vice president, and Robert Hebb, horticulturist, with horticultural offices and facilities; C. Robert Long, with library facilities; George Bookman, vice president, with general administration and public affairs; William Beal, director of finance, and William Goldsmith, business manager, with financial records and reports. Most of all, we express our deepest appreciation to the Mary Flagler Cary Charitable Trust, not only for making the entire Cary Arboretum possible, but especially for their patience and encouragement during this difficult period of creating and bringing to realization a building that has deviated far from the norms of design and planning, yet will surely go far to usher in a new era in building design that is more nearly compatible with the realities of the future.

Howard S. Irwin  
Director



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